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LA-UR-21-21090
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Title: A VERTICAL DEBURRING ALGORITHM FOR MUON TOMOGRAPHY

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Intended for: Web

Issued: 2021-02-05

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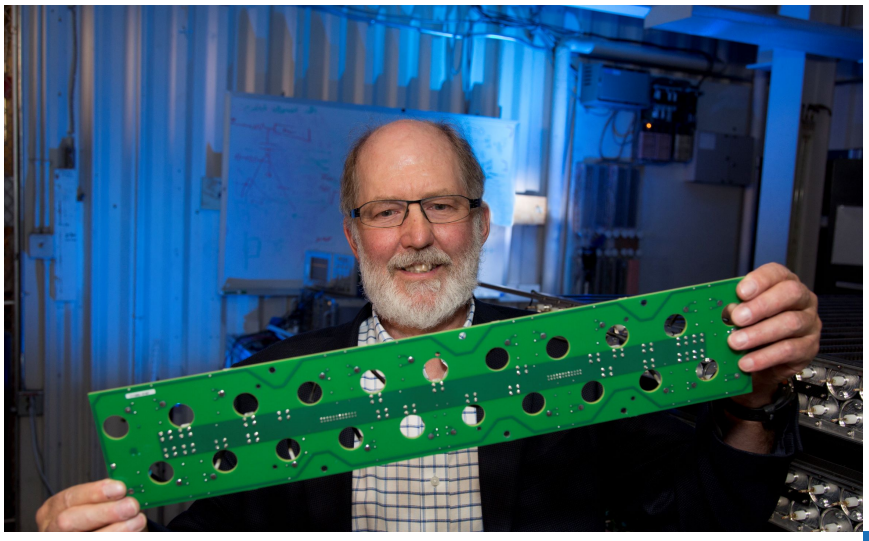

Tech Snapshot

Nuclear

Published: Feb 4, 2021

A VERTICAL DEBURRING ALGORITHM FOR MUON TOMOGRAPHY

Reducing vertical blur in muon tomography images

BENEFITS

This LANL technology produces better images than can normally be obtained from muon scanners, which aids in potentially faster and more accurate evaluation of screened objects.

- Improved vertical resolution from muon scanners
- More accurate identification of imaged objects

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SUMMARY

Los Alamos researchers have developed a technology that improves the quality of images generated by muon tomography techniques, where naturally existing cosmic radiation is used as an energy source for identifying very dense materials. When using muon tomography, blurring can occur on the vertical aspect of images, making it more difficult to interpret data. This vertical de-blurring technology will correct these abnormalities and improve image quality for better evaluation of containers that may have dense matter such as special nuclear materials. This technology has been demonstrated in the laboratory and was evaluated in the field for efficacy.

MARKET APPLICATION

This technology may be applied to any monitoring cite that uses muon tomography, which typically includes the monitoring of borders and ports for radioactive contraband crossing from one country to another. The LANL vertical de-blurring technology will integrate with muon tomography software platforms at individual test sites.

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WHY WE ARE BUILDING A VERTICAL DEBURRING ALGORITHM FOR MUON TOMOGRAPHY

Muon tomography is a part of a mix of technology approaches leveraged to protect our nation's borders and ports from unlawful entry of radioactive materials. Muon tomography imaging devices can accommodate the wide breadth of container and vehicle shapes and sizes. The accuracy of these images is important for quick identification of positive readings for these illicit materials. LANL built this de-blurring technology to ensure better image quality to enhance the value of muon tomographic images to aid in efficient identification of dangerous radioactive contraband.

WHAT'S BEHIND OUR TECHNOLOGY

LANL is a leader in research and development of muon tomography technology for national security applications, and has a long history collaborating with industry partners to solve difficult problems in this area. The present state of technology development in this area remains susceptible to image aberrations due to the physics involved in image resolution. LANL's vertical de-blurring algorithms solved a subset of these issues.

OUR COMPETITIVE ADVANTAGES

Since muons arrive predominantly from overhead, image reconstructions produced by most algorithms lead to vertical blur that compromises analysis of objects being tested. The LANL method improves the value of muon tomographic imagery by producing a more comprehensible image to identify suspicious objects.

OUR TECHNOLOGY STATUS

This technology has been demonstrated. Tests have been conducted with industry using LANL algorithms on real time data with good results. We are looking for a licensing partner to transition this technology and integrate into a muon tomography platform.

PUBLICATIONS AND IP

S133886 – An Algorithm for Removing Vertical Blur from Muon Tomographic Images.

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